arrive tired and wish to sign on with minimum fuss. To avoid queues at the registration booths, all queries should be referred to the secretariat. Any delegate who is unable to produce a congress registration card should be escorted personally to the secretariat, where the problem should be resolved. The common cause of a problem is usually a lost card (in which case a duplicate may be issued), or perhaps registration fees have been paid late, in which case no card would have been issued. It is not unusual for delegates from Eastern Europe to prefer to pay on arrival.

Queries may also arise over tickets for the various social events and here you reap the benefit of being able to produce, from the same plastic envelope as the record card, the delegate's original ticket application form.

A cashier is essential in the registration area to handle registrations, including day registrations and ticket payments. Life is much simpler if only *one* person handles cash and if they have proper facilities.

Throughout the conference, and especially during peak registration times, members of the local organising committee should be constantly on hand to deal with contingencies and also to introduce themselves to any delegate who looks lost. The impression this gives, and justifiably so, of looking after your delegates, greatly helps the success of the entire project.

Hospital Topics

Isolating patients in hospital to control infection*

Part III—Design and construction of isolation accommodation

K D BAGSHAWE, R BLOWERS, O M LIDWELL

British Medical Journal, 1978, 2, 744-748

Good isolation practice is easier in a well-designed building. Easy, direct, and short-distance access to patients, supplies, and facilities lightens the nursing load, thereby giving more time for the proper observance of isolation procedures. There is, however, a potential conflict between the advantages of compact planning and the increased possibilities that this affords for transfer of micro-organisms between patients, by contact and airborne routes. Segregation of patients from each other and separation of clean from potentially contaminated materials is of first importance in creating an effective isolation complex. Reconciling these factors in a practical way is the problem of isolation-unit designs.

Remoteness

It is common experience that infection with particular strains of micro-organisms may be widespread in one ward of a hospital but spread only slowly, if at all, to other ward units. Several factors might be implicated. There will be different nursing and probably domestic staff for each ward, although auxiliary and, to some extent, medical staff may be in common. The wards are usually physically separated from each other by stair-wells and corridors or may be in separate buildings; this will reduce considerably the possibilities of airborne transfer. There will also be a time interval for any contact transfer between the separate units, and during this time micro-organisms might die or be lost from clothing.

These factors that reduce the transfer of microbes between ordinary wards are still more relevant for an isolation unit that is physically separate from the rest of the hospital. For example, hand-washing and clothing changes are more likely to be performed; regulations for restricted access are more likely to be observed. The use of "tacky" mats at the entrance is probably of little bacteriological importance but will improve the general cleanliness within the unit, which may encourage high standards in other respects.

*This paper was prepared with the help of the Hospital Infection Committee of the Medical Research Council but it represents the views only of the authors.

Department of Medical Oncology, Charing Cross Hospital, London W6 8RF

K D BAGSHAWE, MD, FRCP, professor of medical oncology

Division of Hospital Infection, Clinical Research Centre and Northwick Park Hospital, Harrow, Middlesex HA1 3UJ

R BLOWERS, MD, FRCPATH, head of division

Cross-infection Reference Laboratory, Central Public Health Laboratory, Colindale, London NW9 5HT

O M LIDWELL, DPHIL, deputy director

The open ward

If a patient is to be isolated in an open ward the isolation area should be defined as generously as possible and demarcated by washable screens. Selection of the area should take account of ward traffic, location of wash-bowls and toilets, etc. Tables or trolleys for supplies from the central sterile supplies department (CSSD) should be available and a generous supply of bags provided for disposing of contaminated articles. Good lighting is necessary. Clear notices with instructions to exclude cleaners, etc, are important.

VENTILATION OF OPEN WARDS

Good ventilation is a traditional requirement. It does not seem likely, however, that mechanical ventilation of large wards can have any substantial value in controlling hospital cross-infection; the possible reduction of airborne contamination by this means is slight. It is possible to design the ventilation of a subdivided ward so as to reduce substantially airborne-particle transfer between rooms, by a system in which all the sections are supplied with excess air while the corridor acts as a common air drain, or alternatively all the sections have excess extract and air is supplied from the corridor supply.[1 2]

The airflows needed and the degree of effectiveness will depend on whether or not doors are kept closed and on temperature differences and wind pressures acting on the building. It is not usually practicable to keep doors closed except in a specifically designated isolation unit. If doors are often open the excess air volumes required to maintain unidirectional flows over the whole door aperture are about 0·3-0·4 m^3/second (500-700 ft^3/min)[3] with temperature differences as low as 0·5°C (1°F). In a fully air-conditioned building, however, where the temperatures are uniform, as little as 0·1-0·2 m^3/second (200-300 ft^3/min) may be enough.[2] Although airborne-particle transfer may be a hundredfold less than in an unventilated unit, it is very doubtful whether any clinical benefit results. With normal nursing the opportunities for transfer of micro-organisms by direct or indirect contact and from resuspended airborne material derived from contaminated clothing are great.[4]

AIRCURTAIN BEDS

Attempts have been made to provide a clean environment for a patient still remaining in a general ward. Air drawn from the ward is passed through high-efficiency filters and discharged over the patient, either vertically downwards from an overhead canopy or horizontally from a panel behind the bedhead. Without impermeable side curtains the effectiveness of the air jets in containing the clean air and preventing ingress of contaminated air is limited.[5] This reduction is probably not worth while. If side curtains were provided the result would be equivalent to a single room with a high level of ventilation, which could be designed to be either positive or negative with respect to the general ward area. If effective barrier-nursing procedures were then used good isolation should be possible.

Single rooms: ventilation and airlocks

Airborne transfer of infective material between the rooms of a ward or isolation unit may occur in various ways (see part I). For controlling these methods of transfer, several methods of ventilating rooms can be considered.

SIMPLE DIRECTIONAL VENTILATION AND SINGLE DOOR TO CORRIDOR

Fig 1 shows two types of simple directional ventilation in a room with a single door into a corridor. In (*a*) the air is extracted from the room and made up from the corridor. No special conditioning plant is required, and the room is suitable for isolating infective patients. In (*b*) air is brought into the room and discharged into the corridor. Air-conditioning equipment is needed unless a recirculating system taking air from the corridor through a filter is used.[6] This system is suitable for isolating susceptible patients.

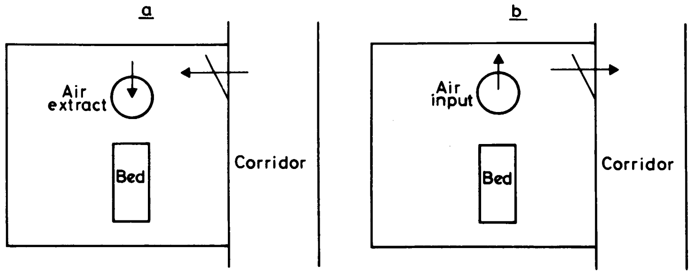

FIG 1—Simple ventilation arrangements for isolation room: (*a*) extract from room; air enters from the corridor through doorway or gaps around door; (*b*) input to room; air passes into corridor through doorway or gaps around door.

These systems need only simple engineering and there are no problems of balancing airflows, so that malfunction and reversed air flows are unlikely to occur. In practice single doors are often left open, which encourages unnecessary entry to the room and increases air exchange with the passage. At least 0·1-0·2 m^3/second (200-300 ft^3/min) is needed to prevent air exchange across an open doorway; if there is a temperature difference of no more than 1°C (2°F) between the room and the corridor this figure will be more than doubled.[3]

If all the rooms in a unit are ventilated in the same way (*a*) and (*b*) give similar degrees of protection from airborne contamination between rooms. The effective improvement over an open situation is about a hundredfold[7]; (*a*) keeps the corridor free from contamination from patient sources in the isolation rooms but exposes the patients to airborne material from the corridor; (*b*) uses the corridor as a kind of air sewer but protects patients in the rooms from the corridor.

It is usually unnecessary to provide grilles or other apertures for the airflow; gaps round doors and other structural cracks generally leave enough room for air to escape.

If the doors to the patients' rooms are kept closed the efficiency of the system can be greatly increased. By using close-fitting doors, eliminating other leaks into the corridor, and providing alternative input or discharge ports that do not communicate with the corridor, the airflow from or to the corridor—whichever corresponds to the design direction—can be reduced to less than 0·03 m^3/second (50 ft^3/min). The resulting improvement in air isolation between rooms may be tenfold or more. Reverse flow will occur only when the doors are opened.[7]

DIRECTIONAL VENTILATION WITH LOBBY AND HATCHES

Adding a lobby or airlock improves the air isolation, possibly by a factor of 10 compared with the simple arrangements of fig 1.[7] Either direction of airflow may be used with the same advantage of engineering simplicity and reliability. The lobby and hatches do, however, facilitate better control of contact transfer (see fig 2). Doors will more often be kept closed, with a

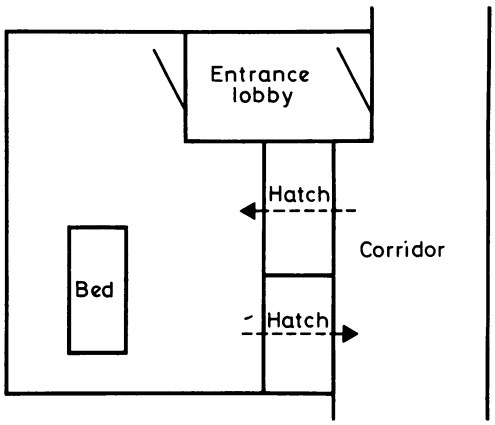

FIG 2—Addition of unventilated entrance lobby and pass-through hatches to room layout; broken arrows indicate movement of materials. Room ventilation may be as indicated in fig 1 (*a*) or (*b*).

reduction of entries and exits. Because only one door to the lobby is open at a time it is necessary only to maintain the desired direction of airflow around the doors and through other gaps. This may be done with quite small air volumes even if there are appreciable temperature differences between the room and the corridor; 0·05-0·1 m^3/second (100-200 ft^3/min) is probably adequate.

A two-bed dismountable isolation unit has been designed by the Atomic Energy Research Establishment (AERE) for the Department of Health and Social Security.[8] This incorporates several interesting design features. It seems unlikely that isolation rooms will, in fact, often be dismantled and moved and erected elsewhere in a hospital; the equipment needs to be considered primarily as a convenient and possibly cheap way of providing additional isolation facilities.

TWO-WAY ISOLATION WITH A VENTILATED AIRLOCK

With a ventilated airlock it is possible to isolate a room in both directions simultaneously and to obtain a high degree of protection against airborne room-to-room transfer (fig 3). For example, the degree of protection may be about 10 000 times that found in an open situation, and considerable isolation may be maintained between room and corridor.[7,9,10] There is no difference in this respect between input to or extract from the airlock but the extract arrangement reduces transfer into the room of any contamination generated in the airlock itself and is therefore preferable.

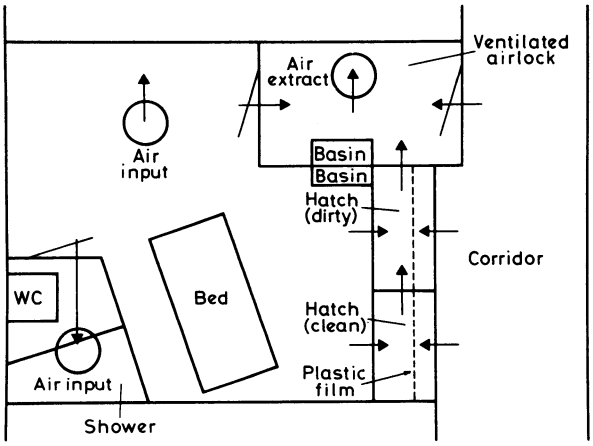

FIG 3—Isolation room with extract-ventilated airlock, toilet, and pass-through hatches. Arrows indicate directions of airflow.

When there is a room supply of air of 0·1-0·15 m^3/second (200-300 ft^3/min) about half may be extracted from the room (including extract from the toilet). If 0·1-0·15 m^3/second (200-300 ft^3/min) is extracted from the airlock about half this will be drawn from the room and an equal volume from the corridor. To maintain the isolation across pass-through hatches part of the airflow—perhaps one-third of the total—should be directed through these.

This system demands a more elaborate ventilation system than other arrangements; in particular the input and extract air volumes must be maintained in the appropriate relation; the maximum tolerance in the designed volumes will be about $\pm 25\%$. Actual installations are usually unsatisfactory in this respect.[10,11]

UNIDIRECTIONAL (LAMINAR) AIRFLOW

The need for dust-free environments for industry has led to the development of high-efficiency air filters which are used to provide particle- and microbe-free air as a directed non-turbulent flow which sweeps out the working space. This arrangement has been applied to the care of highly susceptible patients.[12,13] Because it is relatively easy to reduce airborne contamination to a level at which contact and autogenous infection become predominant even with the best precautions against these, some of the technical requirements for ventilating patient rooms may be considerably less rigorous than for industrial work. The linear air velocity needed to reduce turbulence sufficiently for unidirectional horizontal flow to be established appears to be no more than 0·15-0·25 m/second (30-50 ft/min),[14] and even 0·1 m/second (20 ft/min) may suffice in a downflow room.[15] A filtration efficiency of 90% to the US standard DOP test or BSI sodium-flame test (using particles of 0·1-0·2 μm in diameter) is probably adequate to reach limiting air sterility in the room. Noise control is, however, a major concern and ratings of no more than NC 35-40[16] are required. (This scale takes account of noise concentrated at particular parts of the frequency range.) It has been claimed that this form of ventilation actually reduces autogenous infection,[17] which suggests that this is sometimes airborne.

It is possible to use this form of ventilation to isolate several patients in one room without partitions (fig 4).[15] This may be advantageous for patients who need much nursing and supervision and for those with claustrophobia in single rooms. Those who come into direct contact with the patients must obviously practise non-contact techniques—for example, with regard to clothing, hand preparation, etc—but others who enter the room for activities not needing patient contact need observe only minimal precautions if they remain downstream or to the side of the patients.

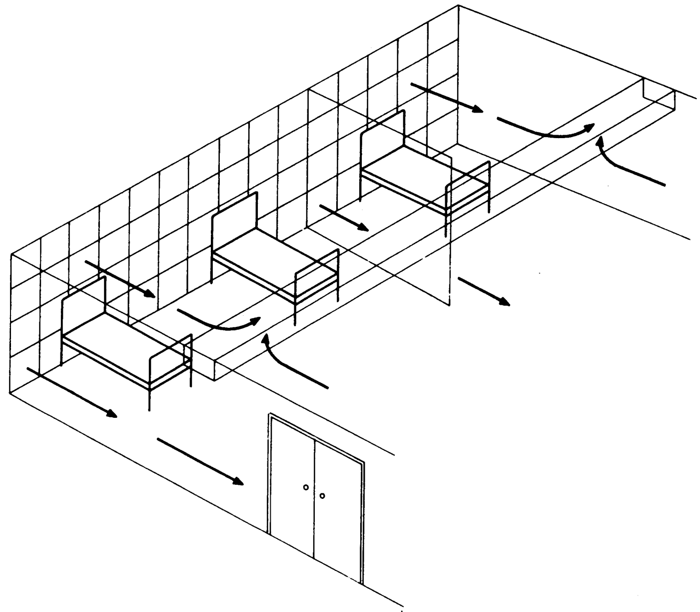

FIG 4—Open-ended multibed unit ventilated by a unidirectional airflow. Air enters through the filter bank behind bedheads and is extracted through slot in roof. Only about 10% of airflow passes into downstream end of the room beyond roof slot. Screens or curtains may be positioned between beds.

With this form of ventilation about 90% of the air is recirculated with the addition of enough fresh air to control smells, carbon dioxide, and other gases. Full air-conditioning is required to control heat gain from the fans. The cost is considerable but convenience and comfort are high and the level of isolation that can be attained is limited only by the measures used to reduce contact transfer. The ease of access itself makes considerable demands on aseptic discipline.

Plastic isolators and ultraviolet light

"Wrapping" the patient in a sterile bag to isolate him from the outside environment is another possibility. The "bag" is held on a frame to give the patient space; is ventilated with a filtered air supply, which may be unidirectional; and is provided with ports for introducing and removing materials, and with glove ports or invaginations for nursing procedures.[18] Some designs also incorporate enough space around the bed for the patient to sit, stand, or even walk a few paces. Toilet accommodation can also be provided. Such systems seem to approach the ultimate in isolation, but carry inherent difficulties in management.[19]

Ultraviolet light has been used as part of isolation systems, especially as a barrier at room doors. There are some difficulties associated with its effect on skin and eyes; the need to screen the lamps from direct vision, unless protective clothing is worn, reduces their effect considerably. Calculations do not suggest that sufficient intensity can conveniently be used to provide an effective barrier to airborne micro-organisms carried on air currents through an open doorway. But irradiation of airlocks may somewhat reduce airborne bacterial transfer through them.[20] Whole-room effects, obtained by irradiation of the air above 2 metres (7 ft), do not exceed those obtained by dilution ventilation and are probably not large enough to be useful. The bactericidal effect of ultraviolet irradiation is less at high relative humidities.[21]

Doors and communications

Doors in isolation units introduce some difficulties. Swing doors need space in which to operate, which may be particularly difficult to find in airlocks, and cause considerable air disturbance. Sliding doors may overcome both these disadvantages, but they are mechanically less satisfactory and need more effort to operate. The grooves in the floor or the hollow spaces into which some doors slide may collect dirt and be difficult to clean.

The need to operate a door handle is inconvenient when something is being carried and provides a possible route for bacteriological transfer via the handle. Mechanically operated doors are becoming more widespread and more reliable. Operation may be by foot pressure or photoelectric; hand press-buttons defeat one object of mechanical operation. The AERE isolation unit[8] incorporates simple mechanically operated sliding doors.

Restricted access from outside the unit needs to be accompanied by means of communication from the entrance to some point within, preferably by two-way telephone, if there is no receptionist or secretary at the entrance. In a unit of any size a means of locating and communicating with nurses from some central point avoids much wasted time. This may be combined with the patient-call system or integrated with a centralised hospital communications system, such as the Cass system.[22]

Many isolation rooms, especially when provided with entrance airlocks and toilet facilities, are effectively cut off from direct communication with the access corridor. This is often disliked by the patients and introduces unnecessary difficulties in nursing. For some patients the sense of abandonment leads to appreciable psychological problems.[7] This aspect of design has usually been ignored by medical staff and architects alike. The design layout in fig 3 allows good direct vision for patient and nurses and if a speaking panel or window of unperforated plastic (as in the AERE design[8]) is used, direct speech is also possible. The provision of separate pass-through hatches for clean and dirty supplies in the area below the inner window allows separate circulation of these two classes of materials and eliminates the need for many entries into the isolation room itself.

Some units have been designed so that visitors can see and speak to the patient without entering the unit. Providing a special corridor for this purpose is expensive. Visitors are usually less of a bacteriological hazard than the hospital staff, and if they take the same precautions with regard to clothing, etc, as the nursing staff they may generally be allowed to enter the patient's room. When this is undesirable, as for the extremely susceptible or highly infectious patient, the use of plastic speaking panels may provide adequate communication similar to that afforded by a visitors' corridor. It will be more acceptable if the layout can be arranged to provide some privacy.

Materials and finishes

Smooth, clean, impervious surfaces without lodgement for dust are obviously desirable. In the extreme their effect can be acoustically and visually repelling. In most places perforated acoustic ceiling materials are bacteriologically unobjectionable. Washable vinyl-faced or vinyl-sheet wall coverings are satisfactory. Noise and the risks of falls are reduced by soft-backed vinyl flooring.

Easy cleaning is important because the appearance of cleanliness is valuable, and minimal maintenance is especially important when some cleaning has to be done by the nursing staff. For strict isolation the fewer patient-staff contacts the better.

Engineering

The requirements for wash basins are discussed below. Avoidance of any risk of bacteriological contamination of the water supplies, as in holding tanks,[23] is clearly more important than usual for highly susceptible patients.

Water closets should be siphonic to reduce aerosol dispersal during flushing[24 25]; for extreme forms of protective isolation exhaust ventilation of the pan may be useful.[26]

The cost of ventilation plant is high, but a high proportion of installations rarely or never function in accordance with the design specification. It is therefore important that an adequate testing programme should be completed before the work is accepted and that this forms part of the contract.[10] Account should be taken in the testing programme of the possible effects of varied weather, especially winds. Good regular maintenance is equally important. This is more likely to achieve its object if there are visual indications, preferably in the isolation unit itself, that critical airflows are within the design limits and that the directions of airflow are correct.

Control of relative humidity (humidification) is likely to be needed for some patients, such as those with exposed burns and those who have undergone chest operations. It will be needed more often if temperatures are kept above 22°C (72°F), which may be advantageous in that it reduces the amount of bedding needed.

Filtration of outside air will rarely need to be better than that recommended for the surgical operating room[27]—that is, to 5 μm—unless there are problems of dust staining. Recirculation or the need for unusually high degrees of bacteriological cleanliness may call for filtration to 90% against 0·1-0·2 μm particles as indicated by the DOP or sodium-flame tests. Contamination of ducts is slight under normal conditions and redispersal rare.[28] There has been vigorous advocacy of terminal filters. These undoubtedly eliminate any small risk there might be from the ducts and may be taken down and cleaned or replaced after an especially infectious patient, but in most circumstances the extra cost does not seem to be justified. In any case the diffusers should be easily cleanable because air turbulence often leads to substantial dust deposits on them from the air of the room.

Isolation rooms should be designed so that, so far as possible, engineering maintenance can be done by staff working outside the rooms.

VALUE OF SUBDIVISION AND VENTILATION

Building design and, in particular, ventilation and air-movement control are primarily relevant when the infecting agent is transmitted by airborne material. In general, the potential for transmission by contact is much greater than by the airborne route but varies according to the nature of infection and the nursing regimen.

There is almost no information to indicate how large a reduction in airborne exposure should be aimed at in any given circumstance. There is, however, reason to think that reductions of less than a factor of 10 are not valuable. Whenever the population exposed to risk varies substantially in susceptibility the number infected will vary less than any variation in exposure.[29] Observations on nasal acquisition of *Staphylococcus aureus* suggest that this effect may be large. The risk of nasal acquisition of this organism appeared to vary less than the change in the inhaled dose and no more than one-half to one-fifth power of the inhaled dose.[30]

References

1 Smylie, H G, *et al*, *British Medical Journal*, 1971, **1**, 67.
2 Foord, N, and Lidwell, O M, *Journal of Hygiene*, 1975, **75**, 15.
3 Shaw, B H, and Whyte, W, *The Building Services Engineer*, 1974, **42**, 210.
4 Lidwell, O M, *et al*, *Journal of Hygiene*, 1975, **75**, 445.
5 Lowbury, E J L, *et al*, *Journal of Hygiene*, 1971, **69**, 529.
6 Williams, R E O, and Harding, L, *Journal of Hygiene*, 1969, **67**, 649.
7 Lidwell, O M, *Hospital Update*, 1977, **3**, 261.
8 *Nursing Times*, 1971, **67**, 1893.
9 Lidwell, O M, *Journal of Hygiene*, 1972, **70**, 287.
10 Abel, E, in *Airborne Transmission and Airborne Infection*, ed J F Ph Hers and K C Winkler, p 519. Utrecht, Oosthoek, 1973.
11 Hambraeus, A, and Sanderson, H F, *Journal of Hygiene*, 1972, **70**, 299.
12 Bodey, G P, Freireich, E J, and Frei, E, *Cancer*, 1969, **24**, 972.
13 Levine, A S, *et al*, *New Zealand Journal of Medicine*, 1973, **288**, 477.
14 Lidwell, O M, and Towers, A G, *Journal of Hygiene*, 1969, **67**, 95.
15 Lidwell, O M, and Towers, A G, *Lancet*, 1972, **1**, 347.
16 National Physical Laboratory, *The Control of Noise*. London, HMSO, 1962.
17 Burke, J F, in *Proceedings of International Conference on Nosocomial Infection*, ed P S Brachman and T C Eickhoff, p 216. Chicago, American Hospital Association, 1971.
18 Levenson, S M, *et al*, in *Research in Burns*, ed A B Wallace and A W Wilkinson, p 563. Edinburgh, Livingstone, 1966.
19 Levitan, A A, *et al*, *Journal of the American Medical Association*, 1968, **203**, 105.
20 Ayliffe, G A J, *et al*, *Journal of Hygiene*, 1971, **69**, 511.
21 van den Ende, M, Bourdillon, R B, and Lidwell, O M, in *Studies in Air Hygiene*, Medical Research Council Special Report Series No 262, p 176. London, HMSO, 1948.
22 Galley, J, *Health and Social Services Journal*, 1977, **87**, 968.
23 Bassett, D C J, Stokes, K J, and Thomas, W R G, *Lancet*, 1970, **1**, 1188.
24 Newsom, S W B, *Lancet*, 1972, **2**, 700.
25 Bound, W H, and Atkinson, R I, *Lancet*, 1966, **1**, 1369.
26 Darlow, H M, and Bale, W R, *Lancet*, 1959, **1**, 1196.
27 Report, *Ventilation in Operation Suites*. London, Medical Research Council and Department of Health and Social Security, 1973.
28 Whyte, W, *Journal of Hygiene*, 1968, **66**, 567.
29 Lidwell, O M, in *Infection in Hospitals*, ed R E O Williams and R A Shooter, p 49. Oxford, Blackwell, 1963.
30 Lidwell, O M, *et al*, *Journal of Hygiene*, 1975, **75**, 445.

MATERIA NON MEDICA

"Turn down the sound, you're disturbing the elephants"

We woke at dawn in a train trundling slowly through the African bush to the sight of wildebeest, gazelle, and giraffes browsing unconcernedly at the side of the track. This was not the end of an exotic holiday or the last lap of a long safari. We were, in fact, returning from the annual meeting of the Kenya Association of Radiologists.

Once a year we hold an out-of-town meeting, both to let the non-Nairobi members take part and to enable us to have a scientific and social get-together in pleasant surroundings. This year's meeting was held in a coast hotel near Mombasa, where the off-season temperature was kept to a cool 29°C by the brisk south-east monsoon. Our small group managed to produce a scientific session of a reasonable standard with interest added by a variety of unusual cases from leukaemic kidneys to calcified splenic cysts. It would, however, be surprising to a British radiologist to be shown films of Paget's disease, asbestosis, and diverticulitis as examples of rare conditions.

Business over, we relaxed with a swim in the Indian Ocean followed by a dinner-dance held under the stars and gently blowing palm trees.

Last year's meeting was in the no less exciting setting of Tsavo National Park. From the lodge bar, between papers, we were able to view a variety of game at the water-hole against the magnificent backdrop of the snow-capped Kilimanjaro, while inquisitive ground squirrels searched for crumbs around our feet and tropical birds added their brightly coloured plumages to the scene.

Such exotic settings for meetings are, however, not without their disadvantages, or, as we were told by the lodge manager at our evening film, "Turn down the sound, you're disturbing the elephants!" JOHN F CALDER (radiologist, Nairobi).

Seeds of time

Hearing that the garden of a well-known medical institution in London had lost all its foxgloves, I said I would be happy to supply some more seed. Returning home, I thought how much more appropriate it would be if I got the seed from William Withering's former country seat, a short walk away. Edgbaston Hall is hidden behind the Old Church where he is buried, an imposing, Georgian, red-brick mansion overlooking extensive parklands. Now the site of a peaceful golf-course and a 50-acre lake inhabited by geese, duck, and grebes, the estate seems far removed from those lawless days in 1791 when the Birmingham mob, infuriated by dissenters celebrating the French Revolution, burnt down Joseph Priestley's home and threatened to do the same to his friend Withering's. The surrounding woodland has recently been taken over by the University as a small nature reserve, and we had joined an extra-mural class to study its ecology, so it was not difficult to collect the seed, and it was duly dispatched.

Earlier this summer we stood in Gloucestershire fields on a beautiful evening admiring the remains of a Roman village being excavated near Kingscote. On a heap of rubble to one side a group of magnificant poppies tinged blood red by the dying sun reminded us of flowers we had seen in the Mediterranean. "Oh yes," said the custodian proudly, "those are Roman poppies." Driving back we laughed at the woman's naiveté; after all, seeds were carried across fields by the wind or scattered by birds. And then I suddenly remembered my Withering foxgloves: I too was guilty of romanticising, but could cold reason prove either of us wrong?—ALEX PATON (physician, Birmingham).

The vision splendid

If, as I do, you travel a good deal by air you get used to sunsets. The plane, flying into them, prolongs the picture almost interminably and often only with a persistent gold or red rim. Flying away from the sun leads to a rapid depressing suffocation of day, guaranteed to make me reach for my novel and my martini. But to fly across a sunset can be an emotional experience without equal. I've done it often enough—helicoptering into doubtfully secure fire bases, homing from the Australian outback, and merely commuting from city to city in various continents.

Nevertheless, only occasionally does one in Banjo Peterson's words see "the vision splendid." It was my good fortune to catch such a moment flying from Aberdeen recently. Somebody celestial had daubed a streak of smoky red horizontally across the upper azure sky. Below this, from an altitude of 29 000 ft, what another poet called "the upshot beam" was tinging the underbelly of cloud with a pink that in some subtle way interacted rather than clashed with the upper heaven. As ever, the beam was due to fade both as the sun marched westward and the aircraft descended, but not before a last lingering flash of salmon-coloured cotton wool wiped the western horizon clear of detail.

Out of curiosity I looked to my fellow passengers. Only one on the west side of the aircraft was sharing my experience. Most obvious were a quartet of well-organised television executives, whose casual clothes, good suntans, and repeated bar orders exuded the confidence of their self-created, if artificial, environment. They played cards and the beauties of their immediate surroundings were as if they had never been. As the lofty shade advanced, their loud voices established a pseudo-reality and I returned to scribbling a grant application—HUGH DUDLEY (professor of surgery, London).